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ASSESSING ORAL HEALTH-RELATED QUALITY OF LIFE OF COMPLETE DENTURE WEARERS IN BRUNEI DARUSSALAM.

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ABSTRACT

Introduction: The aim of this study is to assess Oral Health-Related Quality of Life (OHRQoL) of complete denture wearers in Brunei Darussalam and identify its associated factors. **Materials and Methods:** A cross-sectional study of complete denture wearers attending the Government dental clinics in the Brunei -Muara District using a standardised questionnaire on patient sociodemographic and OHRQoL (OHIP-EDENT). The OHIP-EDENT scores have a possible range of 0 to 76, with higher scores indicating worse OHRQoL. **Results:** A total of 30 participants were included in this study. The mean (SD) overall OHIP-EDENT score was 15.07 (12.59). The mean individual OHIP-EDENT score was highest for the 'functional limitation' domain (1.60) and lowest for the 'social disability' domain (0.11). Mean overall OHIP-EDENT score was significantly associated with gender, ethnicity, marital status, level of education, and level of income ($p < 0.001$). **Conclusion:** This study suggests favourable levels of OHRQoL among complete denture wearers in Brunei Darussalam, and association between various sociodemographic variables with OHRQoL. The results suggest that denture wearers in Brunei share common complete denture therapy limitations as other populations.

Keywords: Brunei, Complete dentures, Oral health, Quality of life, Satisfaction.

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Keywords: Brunei, Complete dentures, Oral health, Quality of life, Satisfaction.

INTRODUCTION

With growing awareness regarding the impact of oral health on general health, the concept of oral health-related quality of life (OHRQoL) has become increasingly popular in recent years.¹ OHRQoL can be defined as a "multidimensional construct that reflects people's comfort when eating, sleeping, and engaging in social interactions; their self-esteem; and their satisfaction with respect to

their oral health".² Clinically, OHRQoL and satisfaction of denture use have been assessed together in various studies as these two have been shown to be closely associated.³ Thus, OHRQoL can be considered an important aspect of a successful denture therapy.¹

The Brunei National Oral Health Survey 2015-2017 showed that oral health in general has improved significantly since the 1990s.⁴ In 2012, 51 out of the 56 complete dentures issued by the Brunei Prosthodontic Unit were for patients aged above 55.⁵ Consequently, the demand of complete dentures is still expected to rise despite improving oral health. As per our knowledge, there are no

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published studies regarding denture use in Brunei Darussalam. Thus, the aim of this study is to assess the OHRQoL and identify the domains of OHIP which are significantly more problematic, as well as factors which significantly influence OHIP scores, of complete denture wearers in Brunei Darussalam.

MATERIALS AND METHODS

Study Design and Population

This was a cross-sectional study conducted for complete denture wearers attending Government dental clinics in the Brunei-Muara District from January to April 2019. These patients were chosen as the target population as the Government dental services provide majority of complete dentures in Brunei Darussalam. There was a total of 30 participants from two centres: National Dental Centre and Pengiran Anak Puteri Hajah Rashidah Sa'adatul Bolkiah (PARHSB) Sungai Asam Health Centre.

Source population consisted of patients attending their review appointments at the above two dental clinics but had their complete dentures fabricated between November 2017 and April 2019. Patients aged 40 years and above receiving complete upper and lower removable dentures at Brunei government dental clinic were recruited for the study. Patients who were unable to communicate both verbally and in written form; have impaired language comprehension due to pre-existing language disorders; did not have their dentures fabricated in Brunei government clinics; or have pre-existing conditions that may inhibit adaptation to complete dentures or predispose them to orofacial pain were excluded. All eligible patients available during the study period were recruited without sampling.

Data Collection and Research Instrument

The primary investigator was informed be-

forehand regarding the appointment schedules of eligible patients by the clinical supervisors without revealing these patients' personal information. Eligible patients were then approached individually on the day of their appointments and briefed regarding the study; those who agreed to participate with written consent were given a questionnaire divided into two parts: 1) Sociodemographic information: age, gender, marital status, level of education and level of income, and 2) OHRQoL assessed using a shortened version of the original Oral Health Impact Profile (OHIP) modified specifically for edentulous individuals called OHIP-EDENT to evaluate self-reported dysfunction, discomfort and disability attributed to oral conditions.^{6,7} The OHIP-EDENT contains 19 questions based on seven domains (see Appendix i). Each question was answered using a five-point Likert scale from zero to four (0 = Never, 1 = Hardly ever, 2 = Occasionally, 3 = Fairly often, 4 = Very often). "Don't know" responses and blank entries were recorded as missing values.

The questionnaire was bilingually translated into both an English and Malay version and pretested on five patients. There were no recommendations for change from the feedback of the five patients and hence no changes were made.

Data Analysis

The collected data were entered and analysed using RStudio v.4.3.3. Overall OHIP-EDENT scores summated for the 19 questions had a possible range of 0 to 76, with higher scores indicating worse OHRQoL. The median and interquartile range (IQR) of the overall OHIP-EDENT score for the sample were calculated as distribution of the scores was skewed to the left. The mean (SD) overall OHIP-EDENT score and the mean (SD) domain score (possible range of 0 to 4) for the sample were also calculated. Spearman's rank-order corre-

rank-order correlation was used to assess the association between age and OHIP-EDENT scores, while Mann-Whitney U Test was used to assess relationship between the other sociodemographic variables and OHIP-EDENT scores with $p < 0.050$ being used to consider statistical significance.

Ethical Consideration

This study was approved by the Ethics Committee of PAPRSB Institute of Health Sciences (IHSREC) and Medical and Health Research Ethical Committee (MHREC), Ministry of Health, Brunei Darussalam on January 8th, 2019 (UBD/PAPRSBIHSREC/2018/114).

RESULTS

A total of 30 participants were recruited to the study, of which 16 were females and 14 were males. The mean (SD) age of the participants was 62.9 (9.6) years, ranging between

46 and 80 years. Majority of the participants were Malay (83.3%) while the remainder were Chinese or Filipino. Majority of the participants were married (82.8%). More than half of the participants had no formal education or were educated to the Primary level (56.7%), whereas the rest had Secondary education (43.3%). Sixty percent of the subjects had an income of less than \$500 (Table I).

The mean (SD) overall OHIP-EDENT score was 15.07 (12.59). No significant correlation was found between mean overall OHIP-EDENT score and age ($p = 0.635$). However, significant differences were found between the mean overall OHIP-EDENT scores of all the other sociodemographic groups ($p < 0.001$) (Table I).

The mean domain OHIP-EDENT score (Table II) was highest for 'functional limitation' (1.60) and lowest for 'social disability' (0.11). No significant differences were

Table I: Sociodemographic and mean (SD) overall OHIP-EDENT scores of participants (N=30).

Sociodemographic	Total (N = 30)			OHIP-EDENT		
	n	(%)	(95% CI)	Mean	(SD)	p-value ^a
Age	62.9 ^b	(9.6) ^c	(59.4, 66.5)	-	-	0.635 ^d
Gender						
Male	14	(46.7)	(28.8, 65.3)	17.79	(13.61)	<0.001
Female	16	(53.3)	(34.6, 71.2)	12.69	(11.53)	
Marital status						
Married	25	(83.3)	(64.5, 93.7)	14.76	(12.71)	<0.001
Widowed or Divorced	5	(16.7)	(6.3, 35.4)	16.60	(13.28)	
Ethnicity						
Malay	25	(83.3)	(64.5, 93.7)	15.20	(13.05)	<0.001
Chinese or others [†]	5	(16.7)	(6.3, 35.4)	14.40	(11.24)	
Level of education						
No formal schooling or Primary	17	(56.7)	(37.7, 74.0)	11.82	(11.46)	<0.001
Secondary and above	13	(43.3)	(26.0, 62.3)	19.31	(13.17)	
Level of income						
Less than \$500	18	(60.0)	(40.8, 76.8)	12.50	(11.95)	<0.001
\$500 and above	12	(40.0)	(23.2, 59.2)	18.92	(13.05)	

a = Mann-Whitney test (distribution is skewed), b = Mean age, c = Standard deviation, d = Spearman correlation, CI = Confidence interval, SD = Standard deviation, $p < 0.05$ is significant, † = Filipino

Table II: Association between sociodemographics and mean (SD) domain OHIP-EDENT scores.

	OHIP-EDENT domains																										
	Functional Limitation			Physical Pain			Psychological Discomfort			Physical Disability			Psychological Disability			Social Disability			Handicap								
	M	(SD)	p	M	(SD)	p	M	(SD)	p	M	(SD)	p	M	(SD)	p	M	(SD)	p	M	(SD)	p	M	(SD)	p			
Age^a	1.60	(1.25)	0.971 ^b	0.92	(0.74)	0.622 ^b	0.77	(0.97)	0.845 ^b	0.98	(0.98)	0.325 ^b	0.52	(0.89)	0.424 ^b	0.11	(0.25)	0.711 ^b	0.38	(0.75)	0.432 ^b						
Gender																											
Male	1.86	(1.37)	0.994	1.04	(0.63)	0.002	0.86	(1.08)	<0.001	1.21	(1.20)	0.002	0.64	(1.08)	<0.001	0.12	(0.28)	<0.001	0.54	(0.97)	<0.001						
Female	1.38	(1.12)		0.81	(0.83)		0.69	(0.89)		0.77	(0.73)		0.41	(0.69)		0.10	(0.23)		0.25	(0.48)							
Marital status																											
Married	1.49	(1.20)	0.155	0.92	(0.75)	0.249	0.80	(1.00)	0.024	0.92	(0.95)	0.035	0.52	(0.91)	<0.001	0.13	(0.27)	<0.001	0.40	(0.80)	<0.001						
Widowed/ Divorced	2.13	(1.46)		0.90	(0.80)		0.60	(0.89)		1.27	(1.21)		0.50	(0.87)		0.00	(0.00)		0.30	(0.45)							
Ethnicity																											
Malay	1.64	(1.29)	0.155	0.89	(0.73)	0.249	0.78	(0.99)	0.024	0.99	(1.05)	0.035	0.54	(0.96)	<0.001	0.11	(0.25)	<0.001	0.40	(0.78)	<0.001						
Chinese and others	1.40	(1.12)		1.05	(0.87)		0.70	(0.97)		0.93	(0.64)		0.40	(0.42)		0.13	(0.30)		0.30	(0.67)							
Level of education																											
No formal schooling or Primary	1.35	(1.12)	0.717	0.75	(0.77)	0.010	0.74	(1.08)	0.001	0.65	(0.81)	0.005	0.32	(0.56)	<0.001	0.08	(0.22)	<0.001	0.24	(0.47)	<0.001						
Secondary and above	1.92	(1.37)		1.13	(0.68)		0.81	(0.85)		1.41	(1.05)		0.77	(1.17)		0.15	(0.29)		0.58	(1.00)							
Level of income																											
Less than \$500	1.41	(1.07)	0.623	0.76	(0.69)	0.016	0.53	(0.79)	0.002	0.70	(0.91)	0.007	0.42	(0.96)	<0.001	0.15	(0.31)	<0.001	0.39	(0.87)	<0.001						
\$500 and above	1.89	(1.47)		1.15	(0.79)		1.13	(1.13)		1.39	(0.97)		0.67	(0.78)		0.06	(0.13)		0.38	(0.57)							

M = Mean (possible range = 0 to 4), SD = Standard deviation, p = p-value calculated using Mann-Whitney test (distribution is skewed), a = Mean (SD) domain OHIP-EDENT scores of all participants, b = Spearman correlation, p-value < 0.05 shown in bold

found when comparing 'functional limitation' scores between the subgroups of each socio-demographic variable. However, 'physical pain' scores showed significant differences between genders ($p=0.002$), levels of education ($p=0.010$), and levels of income ($p=0.016$). Furthermore, there were significant differences when comparing 'psychological discomfort' scores between the genders ($p<0.001$), marital statuses ($p=0.024$), ethnicities ($p=0.024$), levels of education ($p=0.001$), and levels of income ($p=0.002$). Similarly, 'physical disability' scores varied significantly between genders ($p=0.002$), marital statuses ($p=0.035$), ethnicities ($p=0.035$), levels of education ($p=0.005$), and levels of income ($p=0.007$).

Lastly, significant differences were detected when comparing 'psychological disability', 'social disability', and 'handicap' scores between the subgroups of each sociodemographic variable ($p<0.001$) apart from age.

DISCUSSION

This study set out to assess the OHRQoL of patients with complete upper and lower dentures fabricated between November 2017 and April 2019 by Brunei Darussalam government dental clinics. With a mean overall OHIP-EDENT score of 15.07 (possible range of 0 to 76), the principal finding of this study suggests that the OHRQoL of complete denture wearers in Brunei Darussalam is favourable. In comparison, a recent systematic review and meta-analysis of OHIP-EDENT score for complete denture wearers reported a pool mean baseline score of 28.62 (95% CI: 21.93 to 35.34).⁸ These differences may have been due to cultural and regional variations in perceived denture satisfaction, whereby the Bruneian patients were generally more content with the limitations of complete denture therapy and therefore reported better OHRQoL levels.

Similar to other studies, 'functional limitation', 'physical pain' and 'physical disability' presented as the most problematic domains while 'social disability' was the least problematic.^{9,10} A possible reason for the higher prevalence of the three domains might be because the patients were still adapting to the limitations of the dentures since the dentures are relatively new. With time, most patients learn to accept these shortcomings and to be satisfied with their dentures to some degree.¹¹

On the other hand, the low impact on 'social disability' indicates that though patients do experience some degree of functional compromise, their social lives and relations generally are not affected. Similarly, Harris et al. reported low impacts for 'psychological disability', 'social disability', and 'handicap'. This suggests that edentulous individuals normally do not perceive themselves as being disadvantaged in these aspects and are able to tolerate their conditions such that their social interactions are not compromised.¹²

OHRQoL was significantly associated with all the sociodemographic variables assessed in this study, apart from age. Firstly, patients with higher levels of income generally reported worse OHRQoL compared to those of lower income levels. This is similar with the findings of Celebić et al. whereby a lower socioeconomic status was associated with better denture satisfaction.¹³ This might be because patients of lower socioeconomic status have lower expectations for their treatment outcome and are generally less affected by their oral health.¹⁴

Surprisingly, men reported more problems compared to women in every domain of the OHIP-EDENT in this study. This contradicts the findings of Ulinski et al. who found that female denture patients demonstrated lower OHRQoL levels; the study may have reported lower OHRQoL levels for wom-

en due to reporting biases, whereby women were more willing to reveal pain or discomfort compared to men.^{15,16}

Interestingly, patients with higher levels of education reported worse OHRQoL compared to those with lower levels of education, which contradicts the results of Kranjčić et al.¹¹ A possible explanation is that those with higher educational levels may have been more aware of the importance and implications of oral health; thus, they could have been more affected psychologically by the limitations of complete dentures and therefore self-reported lower levels of OHRQoL.

Limitations and Recommendations

Nonetheless, the findings of this study should be considered with the limitations kept in mind. Firstly, this study was limited by a small and localised sample due to time constraints, difficulty recruiting subjects and limited number of eligible patients. Thus, this study may only serve as a representation of the Brunei-Muara district, and future larger studies should be done for the whole country. Secondly, the proportions of the different ethnicities and marital statuses may not be representative of the population. The resultant participants were mostly Malay and married, which may have resulted in misleading associations between OHRQoL and the subjects' ethnicity and marital status due to high type II error rate. The findings of this study suggest that complete denture wearers in Brunei Darussalam generally share similar concerns with denture wearers outside of Brunei which demonstrates the universal limitations experienced by most complete denture wearers. The York and McGill consensus advocates the use of implant overdentures as the first choice of treatment for edentulous patients to overcome the limitations of complete dentures.^{17,18} As the government dental services in Brunei Darussalam have yet to establish the routine provision of implant overdenture therapy, perhaps more consideration should

be given to improving the availability and acceptability of this method of treatment.

CONCLUSION

In conclusion, this study suggests promising levels of OHRQoL among complete denture wearers in Brunei Darussalam. 'Functional limitation', 'physical pain' and 'physical disability' were the most affected domains among complete denture wearers which concurs with other similar studies on this subject. Factors such as gender, marital status, ethnicity, level of education, and level of income were found to significantly affect the OHRQoL of complete denture wearers. The findings also suggest the necessity of establishing implant overdentures as a readily available treatment option in the Brunei government dental services to overcome the inevitable shortcomings of complete dentures. Despite this, future larger studies are required to include dental clinics in the other three districts to obtain a more representative sample of the whole country.

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DISCLOSURE

All authors have made substantial contribution to the manuscript. The authors do not declare any financial or conflicts of interest in preparing this manuscript.

REFERENCES

- 1: Bennadi D, Reddy CVK. [Oral health related quality of life](#). *J Int Soc Prev Community Dent.* 2013;3(1):1–6. [Accessed 2018 Jun 25].
 - 2: RM BAIJU, Elbe PETER, NO VARGHESE, Remadevi SIVARAM. [Oral health and quality of life: Current concepts](#). *J Clin Diagn Res.* 2017;11(6):ZE21-ZE26. [Accessed 2020 Jan 14].
 - 3: Michaud PL, De Grandmont P, Feine JS, Emami E. Measuring patient-based outcomes: Is treatment satisfaction associated with oral health-related quality of life? *J Dent.* 2012;40(8):624–631.
 - 4: Fizah HAB. [Something to smile about: Oral health improves in Brunei](#). *Borneo Bulletin* [Internet]. 2017 May 18 [Accessed 2018 Jun 25].
 - 5: Department of Dental Services. [Oral Health Information Booklet 2012](#). Brunei Darussalam: Author; 2012. [Accessed 2018 Jun 25].
 - 6: Slade G. [The Oral Health Impact Profile](#). Meas Oral Heal Qual Life Ed by Slade GD Chappel Hill Univ North Carolina Dent Ecol. 1997:93. [Accessed 2018 Jun 25].
 - 7: Allen F, Locker D. A modified short version of the oral health impact profile for assessing health-related quality of life in edentulous adults. *Int J Prosthodont.* 2002;15(5):446–50.
 - 8: Duale JM, Patel YA, Wu J, Hyde TP. A Systematic Review and Meta-Analysis of Baseline Ohp -Edent Scores. *Eur J Prosthodont Restor Dent.* 2018;26:17–23.
 - 9: Tôrres A, Maciel A, de Farias D, de Medeiros A, Vieira F, Carreiro A. [Technical Quality of Complete Dentures: Influence on Masticatory Efficiency and Quality of Life](#). *J Prosthodont.* 2017;28(1):e21–6. [Accessed 2020 Jan 14].
 - 10: Viola AP, Takamiya AS, Monteiro DR, Barbosa DB, et al. Oral health-related quality of life and satisfaction before and after treatment with complete dentures in a Dental School in Brazil. *J Prosthodont Res.* 2013;57(1):36–41.
 - 11: Kranjčić J, Mikuš A, Peršić S, Vojvodić D. [Factors Affecting Oral Health-Related Quality of Life Among Elderly Croatian Patients](#). *Acta Stomatol Croat.* 2014;48(3):174–82. [Accessed 2018 Jun 25].
 - 12: Harris D, Benington IC, Connell BO, Sheridan S, Marley J, Benington IC. A comparison of implant-retained mandibular overdentures and conventional dentures on quality of life in edentulous patients: a randomized , prospective , within-subject controlled clinical trial. *Clin Oral Implants Res.* 2011;24(1):96–103.
 - 13: Celebić A, Knezović-Zlatarić D, Papić M, Carek V, Baucić I, Stipetić J. [Factors related to patient satisfaction with complete denture therapy](#). *J Gerontol A Biol Sci Med Sci.* 2003;58(10):M948–53. [Accessed 2018 Jun 25].
 - 14: Pistorius J, Horn JG, Pistorius A, Joachim K. [Oral Health-Related Quality of Life in Patients with Removable Dentures](#). *Schweiz Monatsschr Zahnmed.* 2013;123(11):964–71. [Accessed 2018 Jun 25].
 - 15: Ulinski B, do Nascimento MA, Lima AMC, Benetti AR, Poli-Frederico RC, Fernandes, KBP, et al. [Factors Related to Oral Health-Related Quality of Life of Independent Brazilian Elderly](#). *Int J Dent.* 2013;2013:1–8. Article ID 705047. [Accessed 2018 Jun 25].
 - 16: Samulowitz A, Gremyr I, Eriksson E, Hensing G. [“Brave Men” and “Emotional Women”: A Theory-Guided Literature Review on Gender Bias in Health Care and Gendered Norms towards Patients with Chronic Pain](#). *Pain Res Manag.* 2018;2018:1–14. Article ID 6358624. [Accessed 2020 Jan 14].
 - 17: British Society for the Study of Prosthetic Dentistry. The York consensus statement on implant-supported overdentures. *Eur J Prosthodont Restor Dent.* 2009;17(4):164–5.
 - 18: Feine JS, Carlsson GE, Awad MA, Chehade A, Duncan WJ, Gizani S, et al. The McGill consensus statement on overdentures. Mandibular two-implant overdentures as first choice standard of care for edentulous patients. *Gerodontology.* 2002;19(1):3–4.
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